

DRAFT ENVIRONMENTAL ASSESSMENT

BRICE PRAIRIE BARRIER ISLANDS PROTECTION PROJECT

Navigation Pool 7, La Crosse County, Wisconsin

LA CROSSE DISTRICT

**UPPER MISSISSIPPI RIVER NATIONAL
WILDLIFE AND FISH REFUGE**

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TABLE OF CONTENTS

PAGE

Chapter 1. Purpose and Need for Action	4
1.1 Purpose.....	4
1.2 Need.....	4
1.3 Decisions That Need to be Made	5
1.4 Background.....	5
Chapter 2. Alternatives, Including the Proposed Action	6
2.1 Alternatives not Considered for Detailed Analysis	6
2.2 Alternatives Carried Forward and Analyzed	6
2.2.1 Alternative A (Proposed Action)	6
2.2.2 Alternative B (No Action)	8
2.2.3 Alternative C.....	9
2.3 Summary of Alternative Actions Table	11
Chapter 3. Affected Environment	11
3.1 Physical Characteristics	11
3.2 Biological Environment	11
3.2.1 Habitat/Vegetation	11
3.2.2 Listed, Proposed, and Candidate Species	12
3.2.3 Other Wildlife Species.....	13
3.3 Land Use.....	13
3.4 Cultural/Paleontological Resources	13
3.5 Local Socio-economic Conditions	14
Chapter 4. Environmental Consequences	15
4.1 Alternative A (Proposed Action)	15
4.1.1 Habitat and Biological Impacts.....	15
4.1.2 Listed, Proposed, and Candidate Species	15
4.1.3 Cultural Resources	16
4.1.4 Environmental Justice.....	17
4.1.5 Cumulative Impacts	17
4.2 Alternative B (No Action)	18
4.2.1 Habitat and Biological Impacts.....	18
4.2.2 Listed, Proposed, and Candidate Species	19
4.2.3 Cultural Resources	19
4.2.4 Environmental Justice.....	19
4.2.5 Cumulative Impacts.....	19
4.3 Alternative C.....	20
4.3.1 Habitat and Biological Impacts.....	20
4.3.2 Listed, Proposed, and Candidate Species	20
4.3.3 Cultural Resources	20
4.3.4 Environmental Justice.....	21
4.3.5 Cumulative Impacts.....	22

4.4 Summary of Environmental Consequences by Alternative (Table)	24
Chapter 5. List of Preparers	25
Chapter 6. Consultation and Coordination With the Public and Others	25
Chapter 7. Public Comment on Draft EA and Response	25
Figure 1	26
Figure 2	27
Figure 3	28
Figure 4	29
Figure 5	30
Appendices.....	31

1. Purpose and Need

1.1 Purpose

Most of the lakeside shoreline along the lower Brice Prairie Barrier Island (lower barrier island) has been eroding due to wave and ice action, exacerbated by high water events (Figure 1). The channel, located between the island and mainland, is becoming shallower and narrower due to erosion and sediment deposition. At the southeast corner of the island, the channel has narrowed due to deposition. Conversely, the channel at the northwest end of the island (Blackdeer's Cut) has widened through the effects of ice heaving, erosion, and deposition and now has poor sight lines for boaters caused by plant growth on accreted areas. The purpose of this Environmental Assessment is to evaluate various alternatives to reduce erosion, address sediment deposition, and to protect habitat.

1.2 Need

Beds of submersed, emergent, and rooted floating aquatic plants thrive in the shadow of the Brice Prairie Barrier Islands. The diverse aquatic plant community found in this backwater complex is important habitat for fish, waterfowl (puddle and diving ducks, geese, and swans), other migratory birds (raptors and wading birds such as great blue herons and great egrets), furbearers (muskrats), and amphibians (turtles). The islands also provide habitat for a variety of wildlife including birds (songbirds, raptors, wading birds, and nesting waterfowl) and mammals. The channel provides boat access to Lake Onalaska from the Upper Brice Prairie Boat Landing. The lower barrier island serves as a visual barrier that decreases disturbance to waterfowl in a closed area of the Upper Mississippi River National Wildlife and Fish Refuge (Refuge) from activities along the shoreline and from boats. Moreover, the barrier island also protects the Brice Prairie shoreline from wave-induced erosion.

If the barrier islands are lost due to erosion, more than island habitat is lost. River currents or wind-generated waves would enter the once protected area, uprooting the vegetation beds. The longer wind fetch would cause waves to continue to build in size and stir up bottom sediments. Once the sediment is suspended in the water, it blocks the light that submersed plants, such as wild celery (*Vallisneria americana*), need to grow. Wave action may also prevent plants from re-colonizing areas. Wave action also levels the bottom as high spots erode and deeper areas fill with sediment. The result is a loss of depth diversity and associated habitat.

Specific project needs include:

- Protect the island by stabilizing the most severely eroding sections of shoreline.
- Protect aquatic habitat behind the islands from current and wind-generated waves.
- Protect terrestrial habitat on the islands.
- Provide a safe boating channel that the public can continue to use.
- Reduce disturbance to migratory waterfowl by continuing to provide a safe boating channel.

- Complete the various project components based on the available funds using the priorities described in this document.

1.3 Decisions that Need to be Made

The Regional Director, U.S. Fish and Wildlife Service (Service), Region 3, will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared.

1.4 Background

The proposed project is located in the NE 1/4, SE 1/4 of Section 22, SW 1/4 of Section 23 and NW 1/4, NE 1/4 of Section 26, T.17N.-R.8W., Town of Onalaska, La Crosse County, WI. The upper and lower Brice Prairie Barrier Islands located within the project area are owned by the U.S. Army Corps of Engineers (USACE) but outgranted to the Town of Onalaska. Both islands are also part of the Refuge through the terms of a Cooperative Agreement. Further, the lower island and part of the upper island are located within the Refuge-designated Lake Onalaska Closed Area.

Most of the funding for this project is being provided by the U.S. Fish and Wildlife Service using supplemental funding received to repair damage experienced during the 2001 flood. Funding is limited, so needed repairs were identified, and then prioritized. Additional funding may be provided by other agencies, local organizations, or individuals. USACE personnel are involved in project planning. Actual project construction would be completed by a private contractor(s).

Impoundment of the Upper Mississippi River by the construction of locks and dams for commercial navigation permanently flooded the river valley and created numerous islands. Erosion caused by waves, ice, and river currents has reduced the number and acreage of islands in lower Pool 7 and Lake Onalaska. The Brice Prairie Barrier Islands were formed in the late 1960's from material removed during the dredging of the adjoining access channel.

Resource agencies have made protecting the shorelines of existing islands a priority in recent years. In 1986, 300 hundred tons of large rocks were used to stabilize a reach of shoreline near the midpoint of the lower barrier island. Ice action has displaced some of this rock and there is concern that a breach might eventually develop in this section of island. In 1992, a rock mound, rock wedge, and terminal groin were constructed at the southeast end of the lower barrier island. This project has performed well considering the significant wave and ice action that occurs along this section of shoreline.

Other examples of shoreline stabilization in lower Pool 7 and Lake Onalaska during the last 15 years include the Rosebud Island Protection Project (Phase 1), Island 91, Red Oak Ridge Island and several small islands that surround it, and two islands in the barrier island chain located in

the extreme southwest corner of the lake. Three islands were also created in 1989 under the Environmental Management Program (EMP).

2. Alternatives, Including the Proposed Action

2.1 Alternatives not Considered for Detailed Analysis

Reconstructing the lower barrier island and tip of the upper barrier island using the EMP was an alternative not considered for detailed analysis. The planning and design process required to implement this alternative would be measured in years. Because of the severity of erosion, sections of the island could be breached or disappear before the project could be completed.

Stabilizing the shoreline using geotubes filled with sand and placed perpendicular to the island at regular intervals was suggested as a possible option early in project planning. To improve aesthetics, partially burying the geotubes in sand was recommended. Because of the excessive ice action that periodically affects this part of Lake Onalaska, the assessment was that groin-shaped structures would probably get damaged or would be relocated, thereby negating their effectiveness. Further, geotubes do not have direct habitat value. As a result, this alternative was not analyzed and no cost estimates were determined.

Extending the southeast end of the lower barrier island about 500' was a suggestion made at a 27 January 2004 public meeting. Using current island design standards (20' top width, 2' above the average water surface elevation, and protected by a 24" layer of riprap), the cost is estimated to be about \$120 per lineal foot. Therefore, a 500' long island extension would be estimated to cost about \$60,000. An island extension is beyond the scope and available funding for this protection project and will not be considered for more detailed analysis.

Construction by hauling materials over the ice during winter was not considered for detailed analysis because of safety and logistical concerns. The project location requires crossing a flowing water channel where ice thickness would vary and where travel could be dangerous. An ice thickness of 36" is desired for heavily loaded dump trucks. The chance of finding these ice conditions in this area is consistently low. Also, it is not contractually feasible to have a rock supplier on stand-by notice to deliver in the event that adequate ice conditions are met.

2.2 Alternatives Carried Forward for Detailed Analysis

2.2.1 Alternative A (Proposed Action)

Based on the recommendations of the USACE, the proposed action is a four-component project that addresses the most urgent needs. Individual components are listed in priority order. While the goal is to complete all four components, funding limitations necessitate setting priorities. Maintaining the existing island complex was deemed critical. Details include:

1st and 2nd Priorities: Construction of Nearshore Rock Structure along the Lower Barrier

Island: The nearshore structure technique to be used is the construction of a rock wedge along the two most severely eroding sections of shoreline (Figure 2). The first section, about 620' long, is located near the midpoint of the lower barrier island in the same area stabilized in 1986 (Figure 3). A rock wedge with an outer slope of 1V:4H would be constructed. The rock would be placed on ground with an estimated average elevation of 638.0'. The top width of the rockfill would be 3' while the bottom footprint would be about 14' wide, resulting in a volume of one cubic yard of rockfill per lineal foot. A rock wedge with the same dimensions and estimated volume would be constructed to stabilize a 490' long section of shoreline located near the southeast end of the island (Figure 3).

3rd Priority: Rock Wedge Construction at tip of Upper Barrier Island and Dredging at Northwest End of the Lower Barrier Island (Figure 4):

The shoreline on the north side of Blackdeer's Cut (tip of upper barrier island) would be stabilized using a 300' long rock wedge with an outer slope of 1V:4H. The same cross section and cost assumptions were used for the rock wedge as described above. Sand eroded from the islands has formed sandbars that extend into the channel on both sides of the opening. From the standpoint of boater safety, it is desirable to remove these sandbars to improve visibility for boats entering and leaving the Brice Prairie Channel. A 30' wide by 40' long by 2' deep dredge cut would be excavated, resulting in a total available depth of 4' below the average pool elevation. The excavated material, about 90 cubic yards, would be placed on the barrier island adjacent to the dredge cut.

4th Priority: Dredging at Southeast End of the Barrier Island (Figure 4): The existing channel has adequate depth, but is too narrow for boat traffic. Dredging is needed to widen this channel. Project planning has focused on the width of this channel. If too large, increased flow may result thereby degrading the quality of the winter Centrarchid habitat in the channel. Because of this concern, dredging would be limited to the amount necessary to establish a channel wide enough to safely accommodate passing of two boats (30'). The dredge cut would be approximately 100' long by 20' wide and dredged to a depth of 4' below average pool elevation. About 370 cubic yards of material (primarily sand) would be removed.

Worksite Access: Access to the proposed worksites is a challenge. The past two construction projects on the lower barrier island utilized two different methods for access. During the 1986 project, the original plan was winter construction with dump trucks crossing the channel on the ice. Insufficient ice thickness forced abandonment of the plan. The following spring, the Wisconsin National Guard Engineering Unit in Onalaska used several sections of shallow draft floating bridge as a truck ferry to reach the worksite. The project was aided by high water that afforded tow boats enough clearance to maneuver to the project site. Once at the worksite, the rock was dumped off the end of the bridge. During the October 1992 project, riprap was trucked to the Upper Brice Prairie Boat Landing, unloaded, reloaded on a shallow draft barge, barged down the Brice Prairie Channel to the worksite, and then unloaded and placed on the island using a front end loader.

A number of methods may be used to reach the various worksites identified in this project, including the two methods employed in past projects and previously described. To access the sections of the lower barrier island requiring the rock wedge, building a land bridge in late fall that would allow equipment access to the lower barrier island in winter has been suggested. The rock would be transported to worksites over this bridge. When the project is completed, the land bridge would be removed and the channel restored.

Dredging the channel at the southeast end of the island would be done mechanically from a shallow draft barge and the material placed on the island or barged to an approved disposal site. Equipment and material access to the worksites located at the northwest end of the island could also be via shallow draft barge working from staging areas located at the Upper Brice Prairie Boat Landing, the former Blackdeer's landing, or some other location. The intent is to work with the contractor to identify staging areas and methods of access.

Table 1. The following table, developed by USACE staff, summarizes the designs and costs associated with Alternative A (Proposed Action) and shows the relative priority of accomplishing each of the project features.

Priority	Project Feature	Length	Unit Cost	Estimated Cost
1	Rock wedge near mid-point of barrier island	620 feet	\$60/foot	\$37,200
2	Rock wedge near SE end of barrier island	490 feet	\$60/foot	\$29,400
3	Rock wedge @ Blackdeer's Cut, NW end	300 feet	\$60/foot	\$18,000*
	Dredging of south lobe	40 feet (90 CY)	\$7.50/CY	\$ 700
4	Dredging at SE end	100 feet (370 CY)	\$7.50/CY	\$ 2,800
Total for all features				\$88,100

* Cost of access dredging at the NW end is included in the rock cost.

2.2.2 Alternative B (No Action)

With this alternative, no action would be taken to protect the eroding sections of shoreline on the lower barrier island, widen the channel at the southeast end of the island, protect the tip of the upper barrier island, and dredge the lobe in the channel. In time, breaches would develop in the lower barrier island, threatening the overall island integrity. Material removed as breaches develop and/or the island erodes, would likely accumulate in the channel, resulting in a decrease in depth diversity. If all or parts of the islands disappear or the channel fills, restoration through the EMP, or a similar program, may be possible. However, the time for this to occur would be measured in years and would require designation as a high priority project in the Upper Mississippi River System.

2.2.3 Alternative C

Alternative C addresses resource problems in the same areas as described under Alternative A. Details include:

1st and 2nd Priorities: Construct Offshore Structure to Stabilize Shoreline Along Lower Barrier Island: Instead of constructing a rock wedge to protect the two sections of shoreline most in need of stabilizing, an offshore structure, known as a rock mound, would be used. A rock mound with an outer slope of 1V:2H would be constructed at distances ranging from 25-50' offshore. The offshore structure would be 4-5' in height and would be placed at the midpoint of the lower barrier island and near the southeast end of the same island.

At an estimated cost of \$120 per lineal foot, constructing 1,110' of rock mound along the two sections of shoreline most of need of stabilizing would cost an estimated \$133,200.

Access to these worksites pose the same challenges addressed in Section 2.2.1.

3rd Priority: Rock Wedge/Mound Construction at Tip of Upper Barrier Island and Dredging at Northwest End of the Lower Barrier Island (Figure 5): Instead of constructing 300' of rock wedge along the existing shoreline at the tip of the upper barrier island, a combination rock wedge and rock mound would be constructed with this alternative. The rock wedge would be placed along 150' of shoreline; a rock mound, 150' in length, would extend to the edge of the channel in Blackdeer's Cut. By constricting Blackdeer's Cut, flows would be reduced, thereby increasing the attractiveness of the downstream channel area to wintering Centrarchids.

According to fisheries biologists with the Wisconsin Department of Natural Resources (DNR), the channel historically served as overwintering habitat after the channel was dredged in the late 1960's. Velocities need to be reduced to about 0.03 ft./s. downstream of Blackdeer's Cut for the channel to provide good overwintering habitat. The combination rock wedge/mound would also accomplish the primary project goal of protecting the tip of the island.

The cost estimate for this structure is \$27,000 (150' of rock wedge at \$60/foot = \$9,000 and 150' of rock mound at \$120/foot = \$18,000 for a total of \$27,000).

4th Priority: Dredging at Southeast End of the Lower Barrier Island: To reestablish the width and depth of the Brice Prairie Channel in this location, equipment access would be from the mainland rather than from a shallow draft barge. The shoreline adjacent to the worksite is Corps-owned land. To access this strip of federal land from the mainland requires traveling across private land (vacant lots) from County Trunk Highway ZB, then down a steep slope to the shoreline. Constructing an access road down the slope would be required. The advantages of working from this site include greater flexibility in handling material. The material could be allowed to drain, stockpiled, and then trucked away to an approved beneficial use site. Working from this site would also allow for more material to be removed. Rock needed for the lower section of rock wedge could also be stockpiled at this site, then barged to the worksite for placement.

In 1997, the Natural Resources Conservation Service designed a 12' deep dredge channel at this site that requires the removal of 1,800 cubic yards of material. With land-based access, the cost to dredge and remove this material is estimated at \$5.00 per cubic yard. The estimated cost to complete this dredging was \$9,000 (1,800 cubic yards x \$5.00 = \$9,000).

Two privately-owned lots in proximity to the worksite were considered for access. The owners of the upstream location did not grant their approval, so this site was removed from further consideration. As a condition for using the second, or downstream site, dredging an access channel from the shoreline out to a connecting channel was suggested.

For planning purposes, the dimensions of this access channel were estimated to be 100' long x 100' wide x 3' deep, or about 1,100 cubic yards. The cost to complete this dredging was estimated at \$8,250 (1,100 cubic yards x \$ 7.50/cubic yard = \$8,250).

Completing this alternative would cost an estimated \$17,250 under this alternative.

Before this site could be used, project details would be negotiated with the landowner and summarized in an agreement. Access dredging would be a one-time operation; no maintenance would be provided.

Table 2. The following table summarizes the designs and costs associated with Alternative C and shows the relative priority of accomplishing each of the project features.

Priority	Project Feature	Length	Unit Cost	Estimated Cost
1	Rock mound near midpoint of barrier island	620 feet	\$120/foot	\$ 74,400
2	Rock mound near SE end of barrier island	490 feet	\$120/foot	\$ 58,800
3	Rock wedge & rock mound @ Blackdeer’s Cut, NW end. Replaces rock wedge	150’ wedge 150’ mound	\$60/foot \$120/foot	\$27,000*
	Dredging of south lobe	40 feet (90 CY)	\$7.50/CY	\$ 700
4	Dredging at SE end – includes dredging channel (1,800 CY @ \$5.00/CY) and access channel for landowner (1,100 CY @ \$7.50/CY)	1,800 CY	\$5.00	\$ 9,000
		1,100 CY	\$7.50	<u>\$ 8,250</u>
				\$ 17,250
Total for all features				\$178,150

* Cost of access dredging at the NW end is included in the rock cost.

2.3 Table 3. Summary of Alternative Actions

Actions	Alternative A (Proposed Action)	Alternative B (No Action)	Alternative C
Stabilize Sections of Severely Eroding Shoreline	Yes	No	Yes
Aquatic Habitat Protected	Yes	No	Yes
Provide Safe, Accessible Boating Channel	Yes	No, lower end of channel will fill in time	Partially, from channel dredging
Visual Barrier Maintained	Yes	No, breaches likely to develop in island	Yes
Costs	Estimated @ \$88,100	N/A	Estimated @ \$178,150

3. Affected Environment

3.1 Physical Characteristics

The Upper Mississippi River National Wildlife & Fish Refuge (Refuge) was established by an Act of Congress in 1924. The Refuge is located in Pools 4-14 of the Upper Mississippi River in the states of Minnesota, Wisconsin, Iowa, and Illinois. The Rivers and Harbors Act of 1930 authorized construction and maintenance of the current 9' channel by a system of locks and dams. The dams have raised water levels, creating a maze of channels, sloughs, marshlands, and open lakes over the bottomlands.

Increased water surface elevations and decreased current velocities through the river system have changed the configuration of the river bed since impoundment. Higher water levels have caused erosion of islands bordering the main channel, exposing other islands in the backwaters to greater wind fetch and wave action. The islands have been reduced over time by wave action, ice heaving, and flood events. Wave action and flood events have also leveled the topographic relief of the backwater areas by reducing the height, number, and areal extent of islands and filling deeper areas. An influx of sediment has filled some of the floodplain channels and formed deltas in the backwater areas.

3.2 Biological Environment

3.2.1 Habitat/Vegetation

The Brice Prairie Barrier Island Complex is located on Lake Onalaska. Lake Onalaska is a nearly 7,400-acre backwater complex in lower Navigation Pool 7 that provides habitat supporting one of the premier Centrarchid fisheries on the Upper Mississippi River. Lake Onalaska also provides excellent habitat for wildlife, including significant percentages of the continental population of canvasback ducks and tundra swans. Wildcelery, an important

submersed aquatic plant, is a key component of the vegetative community. Rosebud Island (178 acres) and Red Oak Ridge Island (55 acres) are the two largest islands located on the lake. Several smaller islands are located in proximity to these two larger islands. Considerable habitat restoration work has been completed on Lake Onalaska in the past 15 years.

3.2.2 Listed, Proposed, and Candidate Species

Two federally listed species are known to occur in Pool 7 of the Upper Mississippi River: the threatened bald eagle (*Haliaeetus leucocephalus*), and the endangered Higgins' eye pearly mussel (*Lampsilis higginsii*). The eastern massasauga rattlesnake (*Sistrurus catenatus*), which is a candidate species, has been found in the floodplain of the Upper Mississippi River. Bald eagles regularly use the Brice Prairie Barrier Island during migration. The nearest active nest is located in the Gibbs Lake area of Lake Onalaska, about 1.5 miles from the project. The Higgins' eye pearly mussel has been found at several locations in Pool 7 near the main navigation channel, about two miles from the proposed project site. Suitable habitat for the eastern massasauga rattlesnake is located in the Black River Bottoms, a tributary of the Upper Mississippi River that flows into Pool 7.

Additional species classified by the State of Wisconsin as threatened (T), endangered (E), or special concern (SC) includes the following: American eel (*Anguilla rostrata*, SC); Vasey's pondweed (*Potamogeton vaseyi*, SC); mud darter (*Etheostoma asprigene*, SC); elusive clubtail (*Stylurus notatus*, SC); speckled chub (*Macrhybopsis aestivalis*, T); pugnose minnow (*Opsopoeodus emiliae*, SC); starhead topminnow (*Fundulus dispar*, E); weed shiner (*Notropis texanus*, SC); pirate perch (*Aphredoderus sayanus*, SC); western sand darter (*Etheostoma clara*, SC); black redhorse (*Moxostoma duquesnei*, E); pallid shiner (*Notropis amnis*, E); gilt darter (*Percina evides*, T); silver chub (*Macrhybopsis storeriana*, SC); smoky shadowfly (*Neurocordulia molesta*, SC); russet-tipped clubtail (*Stylurus plagiatus*, SC); large water-starwort (*Callitriche heterophylla*, T); red-shouldered hawk (*Buteo lineatus*, T); osprey (*Pandion haliaetus*, T); Blanchard's cricket frog (*Acris crepitans blanchardi*, E); wood turtle (*Clemmys insculpta*, T); Blandings turtle (*Emydoidea blandingii*, T); spectaclecase mussel (*Cumberlandia monodonta*, E); sheepnose mussel (*Plethobasus cyphus*, E); round pigtoe mussel (*Pleurobema sintoxia*, SC); butterfly mussel (*Ellipsaria lineolata*, E); yellow sandshell mussel (*Lampsilis teres*, E); slough sandshell mussel (*Lampsilis teres*, E); rock pocketbook mussel (*Arcidens confragosus*, T); salamander mussel (*Simpsonaias ambigua*, T); monkey face mussel (*Quadrula metanevra*, T); wartyback mussel (*Quadrula nodulata*, T); pistolgrip mussel (*Tritogonia verrucosa*, T); elktoe mussel (*Alasmidonta marginata*, CS); flatfloater (*Anodonta suborbiculata*, SC); purple warty back mussel (*Cyclonaias tuberculata*, E); elephantear mussel (*Elliptio crassidens*, E); ebony shell mussel (*Fusconaia ebena*, E); washboard mussel (*Megaloniais nervosa*, SC); black buffalo fish (*Ictiobus niger*, T); paddlefish (*Polyodon spathula*, T); blue sucker (*Cycorephus elongatus*, T); skipjack herring (*Alosa chrysochloris*, E); and goldeye (*Hiodon alosoides*, E).

3.2.3 Other Wildlife Species

The islands in Lake Onalaska and associated vegetation provide habitat for a wide variety of species including roosting habitat for raptors, migration and nesting habitat for nontropical migrants, and nesting habitat for turtles. The island and associated shallow water zones provide habitat for marsh and water birds such as grebes, white pelicans, double-crested cormorants, bitterns, herons, great egrets, terns, and shorebirds. Aquatic and semi-aquatic mammals, such as muskrats, and many species of reptiles and amphibians also use the islands and associated plant communities.

3.3 Land Use

The lower Brice Prairie Barrier Island was acquired by the USACE and has been outgranted to the Town of Onalaska. The Brice Prairie Barrier Islands are also part of the Refuge; the lower island and part of the upper island are located within the Refuge-designated Lake Onalaska Closed Area.

3.4 Cultural/Paleontological Conditions

The Brice Prairie region contains numerous cultural resources indicating continual human occupation extending over approximately the past 12,000 years. Cultural resources are located across the Prairie, a Holocene-age low terrace formed by glacial outwash, and on islands and other elevated areas (e.g., natural levees) within the Mississippi River floodplain. The proposed barrier island project has the potential to impact cultural resources.

Archaeological investigations have been ongoing in the Brice Prairie/Pool 7 locality for over a century (e.g., Boszhardt 1990; Lane 1976; Thomas 1894, Winchell 1911). Early research in the area centered on the contents of burial mounds and who built them. By the early twentieth century, most practitioners rejected the popular notion that a race of non-American Indians constructed the mounds and Antiquarian investigations gave way to systematic mapping, excavation and scientific research (e.g., Theler and Boszhardt 2003). Modern archaeological research on the Prairie and within Pool 7 began during the 1960s, including site identification surveys, site evaluations, data recoveries, experimental archaeology and field schools. Many of the investigations along the Prairie were conducted under the auspices of the Wisconsin Department of Transportation and completed by the University of Wisconsin-Madison, the Mississippi Valley Archaeology Center (MVAC) and a variety of private archaeological contractors (e.g.; Boszhardt et al. 1984, 1985; Gibbon 1970; O’Gorman 1993; Penman 1984). The Service and the USACE have sponsored several cultural resource investigations within Pool 7, including dredged material placement sites, flood control projects, shoreline surveys, site evaluations, and data recoveries and several literature-based overviews, such as site inventories, geomorphic mapping and shipwreck locations (e.g., Boszhardt 1989, 1990; Hudak 1975; Jalbert et. al. 1996; Jensen 1992; Madigan and Shermer 2001; Overstreet et. al. 1983).

A total of 11 cultural resource sites are within one mile of the Brice Prairie Barrier Islands Protection Project (Table 4). All of these sites are located on the Brice Prairie terrace. Precontact cultural resources include lithic and artifact scatters and village sites. Historic cultural resources include Native American (Ho-Chunk) burials and a Euro-American cemetery. Several cultural resource sites along Brice Prairie are listed on the National Register of Historic Places (NRHP), such as the Tremaine site, within the Midway Archaeological District approximately two miles northeast of the project area. One site near the project area-47LC76-is eligible for listing on the NRHP; the remaining nine sites within one mile of the Project area have not been evaluated for their eligibility for listing on the NRHP.

Table 4. Cultural resources sites within one mile of the Brice Prairie Islands Protection Project.

Site Number	Site Type	Comments
47LC11	Historic Euro-American Cemetery	No Impact
47LC74	Precontact Artifact Scatter	No Impact
47LC76	Precontact Village	No Impact. Eligible for NRHP
47LC77	Precontact Artifact Scatter	No Impact
47LC101	Precontact Artifact Scatter	No Impact
47LC358	Precontact Artifact Scatter	No Impact
47LC396	Precontact Artifact Scatter	No Impact
47LC508	Precontact Artifact Scatter	No Impact
47LC583	Precontact Artifact Scatter	No Impact
Blackdeer Property	Historic Native American burials	No Impact
47LCXXX	Precontact Artifact Scatter	Potential Impact

One cultural resource site, referred to as the upstream access site, is located near the southeast end of the lower barrier island (47LCxxx /USACE-MVP-04-1). This site was originally identified by Brice Prairie residents as a potential access/dredged material placement site. However, the landowners did not authorize their approval to use this site, so it was removed from further consideration.

3.5 Local Socioeconomic Conditions

The Brice Prairie Barrier Island Complex of Lake Onalaska is a popular destination for sport anglers, waterfowl hunters, and for observing wildlife. Major cities in the study area and their populations include La Crosse, Wisconsin - 65,000 and Onalaska, Wisconsin - 15,000. Brice Prairie is located in the Town of Onalaska. The Town surrounds two of the fastest growing municipalities in the region, the City of Onalaska and the Village of Holmen. As a result, the Town is also experiencing considerable development pressure and population growth (Town of Onalaska Comprehensive Plan – Existing Conditions Report). In 2000, an estimated 5,210 people resided in the Town of Onalaska.

The Upper Brice Prairie Boat Landing is the most heavily used landing providing access to the popular Lake Onalaska. Use of the landing typically peaks during opening days of the waterfowl hunting season, with upwards of 100 vehicles/trailers present. The landing receives nearly year-round use. Residential development along the Brice Prairie Channel is nearly complete as few vacant lots remain.

4. Environmental Consequences

4.1 Alternative A (Proposed Action)

4.1.1 Habitat and Biological Impacts

Protecting nearly 1110' of shoreline at two locations on the lower barrier island with a rock wedge, stabilizing the channel openings at the southeast end of the island and at Blackdeer's Cut, and dredging sections of channel near the openings meets the goals of protecting the remaining island habitat, protecting a diverse aquatic plant community, and providing safe recreational boat access. This plant community is important habitat for fish, waterfowl, furbearers, and amphibians. The rock riprap would provide a coarse structure to improve the value of the area for fish species and macroinvertebrates, including crayfish. Some mussel mortality may occur during construction activities. Overall, the impacts should not be substantial because of the relatively small area of habitat affected by construction. The long-term impacts are expected to be positive.

4.1.2 Listed Species

No mussel surveys were conducted in/around the Brice Prairie Barrier Islands. However, two mussel surveys were completed on 11 September 2002 in the work area along the island complex off the southeast tip of Rosebud Island. The St. Paul District, USACE, performed the surveys. Water depths in the survey areas ranged from 0.3 to 1.2 meters. Most of the area contained dense beds of submersed aquatic vegetation. Substrates ranged from loosely packed sand to muck. The area was very lentic in nature, with no visual current.

Eight commonly occurring mussel species were encountered, with giant floaters (*Pygandon grandis*), threeridge (*Ambema plicata*), and fat mucket (*Lampsilis silquoidea*) dominating the mussel assemblage (Appendix 1). No federally- or Wisconsin-listed endangered or threatened mussel species were encountered during the survey. The species assemblage found is typical of lentic habitat conditions. The lentic habitat conditions and the species assemblage found would indicate that the federally-listed Higgins' eye pearly mussel is not likely to be present in the project area.

Zebra mussel infestation on the native mussels was moderate, ranging from a few to many per native mussel. The zebra mussels were represented by a wide range of age classes, from very young to age 2.

No active bald eagle nests are located within one-mile of the proposed project. Also, no habitat for eastern massasauga rattlesnakes would be affected by the project. Given the habitat similarities between Rosebud Island and the Brice Prairie Barrier Islands, the habitat requirements of the mussel species found during the Rosebud Island surveys, and the relatively small area affected by construction, this project is not likely to adversely affect federal or state-listed threatened/ endangered species. The U.S. Fish and Wildlife Service's Twin Cities Field Office and the Wisconsin DNR were consulted and concurred with this determination (addressed in completed Intra-Service Section 7 Biological Evaluation Form).

4.1.3 Cultural Resources

The USACE Archaeologist, assisted by personnel from the Mississippi Valley Archaeology Center (MVAC), completed a Phase I cultural resource investigation for the Brice Prairie Barrier Islands Protection Project on 27 April and 27 May 2004. Methods included a literature review, shoreline survey of the island and adjacent terrace sideslope, pedestrian survey, shovel testing, and soil probing. Areas investigated included the barrier island, dredging locations, and two potential access/dredged material placement sites along the Brice Prairie terrace.

One archaeological site (47LCxxx /USACE-MVP-04-1) is located along the terrace near the southeast end of the barrier island and was being considered as a potential access/dredged material placement site. With the exception of possible additional work at this site, which has been removed from further consideration because the landowners did not grant their approval to use this location, the USACE has determined that construction of the Project features (rock wedges, dredging, dredged material placement on the northwest end of the island and on the downstream access/dredged material placement site) will have no adverse effect on historic properties.

A summary of each of the potential project worksites identified under the Proposed Action include:

Lower Brice Prairie Barrier Island: Investigations along the lower barrier island included a shoreline survey via boat and pedestrian survey and soil probing in selected areas. The lower island is a lateral accretion deposit formed by channel migration in the alluvial fan of the Black River. Prior to construction of Lock and Dam 7, the main channel of the Black River flowed between the island and the Brice Prairie terrace, now captured by inundation of the Mississippi River (Lake Onalaska, e.g., MRC 1894). Typically, lateral accretion deposits and alluvial fans have the potential to harbor deeply buried cultural deposits.

During the later half of the nineteenth century, the Black River Improvement Company constructed a berm atop the Island to control the flow of logs from the delta of the Black River (Sanford and Hirscheimer 1951; History of La Crosse County 1881). Informal soil probing (1-inch sampler) at various locations along the island (e.g., dredged material placement along the northwest portion of the island) confirmed that sediments consistent with berm construction (e.g., fine sands from dredged material) cap the island. No buried soils were identified within

approximately 1-2 meters below the modern ground surface. Although buried soils may exist along the island, they are beyond the depth of practical identification methods. Further, the design and construction of the project features (rock wedges and dredged material placement) will not impact deeply buried deposits. No cultural resources were identified along the barrier island. The USACE has determined that construction of project features along the barrier island (rock wedges and dredged material placement on the northwest end of the island) will have no adverse effect on historic properties. No additional cultural resource work on the barrier island is recommended.

Dredge Cuts: Areas proposed for dredge cuts are mostly located along the former channel of the Black River. The northwestern dredge cut likely breached the island, rendering any cultural deposits that may have been located there highly disturbed. No historic shipwrecks or channel structures (e.g., wing dams) are within the project area and no cultural resources were identified along areas adjacent to the proposed dredge cuts. Therefore, the USACE has determined that dredging adjacent to the barrier island will have no adverse effect on historic properties and no additional cultural resource work is recommended.

Coordination with the Wisconsin State Historic Preservation Office (SHPO) is in progress.

4.1.4. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 Federal Register 7629 (1994), directs federal agencies to incorporate environmental justice in their decision-making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse environmental effects of their programs, policies, and activities on minority or low-income populations.

No environmental justice issues exist for the proposed action. The Brice Prairie Barrier Islands are currently unoccupied and unused for agricultural, industrial, or any other economic activity. This alternative would not create any environmental pollution. No minority or low-income populations would be displaced or negatively affected in any other way by the proposed action.

4.1.5 Cumulative Impacts

Stabilizing the eroding shorelines of islands in this complex increases the likelihood they will continue to provide habitat for a variety of wildlife. Moreover, this island complex protects shallow backwater habitat that supports a diverse aquatic plant community that provides habitat for fish, waterfowl, other migratory birds, furbearers, and amphibians.

Resource agencies have made stabilizing the shorelines of existing islands a priority in recent years for the same reasons. Examples of similar projects in lower Pool 7 and Lake Onalaska include Island 91, Red Oak Ridge Island and several small islands that surround it, the previously identified work along sections of the lower Brice Prairie Barrier Island, and two

islands in the barrier island chain located in the extreme southwest corner of the lake. Island creation has also occurred through the 1989 EMP habitat project in Lake Onalaska.

Also, based on public scoping meetings held in September 2002 in the La Crosse area for the development of the Refuge's Comprehensive Conservation Plan, the public expressed the need to protect shorelines of islands now, rather than rebuilding islands later.

The proposed project would have minimal or no impacts on the following socioeconomic categories: transportation, public health and safety, community cohesion, community growth revenues, regional growth, employment, business activity, food supply, navigation, flooding effects, or energy resources. It would have a positive effect on recreational boating.

Noise Pollution - The immediate vicinity around the project area would be temporarily disrupted by construction activities. Some minor disturbance may occur from noise and human activity, although these impacts are temporary, and adverse impacts to the general public would be short-term.

Recreation and Aesthetic Values - the presence of construction equipment would have a temporary negative effect on aesthetic values in the area. It is expected that most of the material, supplies, and equipment would be loaded/unloaded at the Upper Brice Prairie Landing or Mosey Landing on Lake Onalaska, or the USACE facility at Lock and Dam 7. The Town of Onalaska operates and maintains both boat landings through an agreement with the USACE. The Town will be contacted for their approval. If either landing is used, every effort would be made to schedule the loading/unloading of material, supplies, and equipment to minimize the amount of time the landing is blocked. Long term recreational benefits would be realized because of the depths provided for boat access and safety.

4.2 Alternative B (No Action)

4.2.1 Habitat and Biological Impacts

The Brice Prairie Channel, located between the Brice Prairie Barrier Islands and the mainland, provides overwintering habitat for Centrarchids. Moreover, the barrier islands protect beds of submersed, emergent, and rooted floating aquatic plants from excessive wave action. The diverse aquatic plant community found in this backwater complex is important habitat for fish, waterfowl (puddle and diving ducks, geese, and swans), other migratory birds (raptors and wading birds such as great blue herons and great egrets), furbearers (muskrats), and amphibians (turtles). The barrier islands also provide habitat for a variety of wildlife including birds (songbirds, raptors, wading birds, and nesting waterfowl) and mammals. The channel provides boat access to Lake Onalaska from the Upper Brice Prairie Boat Landing. The barrier islands also serve as a visual barrier that decreases disturbance to waterfowl in a closed area of the Refuge from activities along the shoreline and from boats. Lastly, the barrier island also protects the Brice Prairie shoreline from wave-induced erosion.

Through this alternative, no effort would be made to protect nearly 1110' of eroding shoreline in two locations on the lower barrier island with a rock wedge, stabilize the channel openings at the southeast end of the island and at Blackdeer's Cut, and dredge sections of channel near the openings. Without stabilization, breaches in the island are likely to develop resulting in island loss. As sections of the islands are reduced in size or lost altogether, the amount of protected shallow backwater habitat would also be expected to decrease. Because this habitat type supports a diverse aquatic plant community, fewer vegetated acres would be available for fish, waterfowl, other migratory birds, furbearers (muskrats), and amphibians. The islands also provide habitat for a variety of wildlife including birds (songbirds, raptors, wading birds, and nesting waterfowl) and mammals (deer and raccoons). If the channel would become impassable to boaters due to sedimentation, boaters would likely find alternative routes of out to Lake Onalaska or the Gibbs Lake area and points north. These alternative routes may be in areas used by large concentrations of waterfowl, thereby resulting in increased disturbance.

4.2.2 Listed, Proposed, and Candidate Species

Under the No Action Alternative, no construction activity would occur. Therefore, this alternative would not affect listed, proposed, or candidate species or their critical habitat.

4.2.3 Cultural Resources

If breaches would develop in the barrier island complex, or the islands erode away, wave action would likely increase and accelerate erosion on the mainland where significant cultural resources are known to exist.

4.2.4 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 Federal Register 7629 (1994), directs federal agencies to incorporate environmental justice in their decision-making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse environmental effects of their programs, policies, and activities on minority or low-income populations.

No environmental justice issues exist for the no action alternative. The Brice Prairie Barrier Islands are currently unoccupied and unused for agricultural, industrial, or any other economic activity. This alternative would not create any environmental pollution. No minority or low-income populations would be displaced or negatively affected in any other way by this alternative.

4.2.5 Cumulative Impacts

Resource agencies have made stabilizing the shorelines of existing islands a priority in recent years. Erosion by waves, ice, and river currents has reduced the number and acreage of islands

in Lake Onalaska and the lower section of other pools. When islands are lost, the habitat they provide to a variety of species is lost, and the vegetation beds they help protect are usually lost or reduced in size, diversity, and quality. Therefore, the No Action Alternative is not in accordance with recent efforts to protect existing islands, nor is it in line with the public's interest in protecting the shorelines of islands rather than rebuilding islands after they have eroded away.

4.3 Alternative C

4.3.1 Habitat and Biological Impacts

Construction of rock mounds along the most eroding sections of the lower barrier island meets the goal of stabilizing the shoreline. Constructing a rock wedge/rock mound at the tip of the upper barrier island should also meet the goal of stabilizing this portion of the island. These islands protect a diverse aquatic plant community that is important habitat for fish, waterfowl, furbearers, and amphibians. Rock placed in water would provide a coarse structure to improve the value of the area for fish species such as smallmouth bass. In addition, the rock substrate should also provide habitat for macroinvertebrates, including crayfish.

Because of the excessive ice action that periodically affects this part of Lake Onalaska, rock mounds may get be damaged or relocated, thereby reducing their effectiveness. Another concern is the cost of the rock mounds versus using rock wedge. Constructing 1,110' of rock mound @ \$120/foot is expected to cost \$133,200 compared with the estimate of \$66,600 using rock wedge.

The disadvantages of constructing a rock wedge/mound in this location relate to boater safety, durability, and increased costs. Constructing a rock mound out to the middle of channel raises safety concerns for boaters operating at night or those traveling at high rates of speed as they negotiate passage through Blackdeer's Cut. Because of the severity of ice action in this area, a stand-alone rock mound may not last in this location. A combination rock wedge/rock mound would cost an estimated \$27,000 (150' of rock wedge @ \$60/foot = \$9,000 + 150' of rock mound @ \$120/foot = \$18,000 for a total of \$27,000). In comparison, 300' of rock wedge is estimated to cost \$18,000.

The sections of channel widened and deepened through dredging could provide winter habitat for Centrarchids if the right conditions develop. The disadvantages of dredging include possible disturbance to mussels and vegetation beds, possibly resulting in some mussel mortality. Overall, the short term impacts to mussels and vegetation beds as a result of this project are expected to be localized and minor. The long-term impacts would be expected to be positive.

4.3.2 Listed, Proposed, and Candidate Species

As explained in Section 4.1.2, no mussel surveys were conducted in/around the Brice Prairie Barrier Islands. However, mussel surveys were completed by the St. Paul District, USACE, on 11 September 2002 in the work area along the island complex off the southeast tip of Rosebud Island. Water depths in the survey areas ranged from 0.3 to 1.2 meters. Most of the area

contained dense beds of submersed aquatic vegetation. Substrates ranged from loosely packed sand to muck. The area was very lentic in nature, with no visual current.

Eight commonly occurring mussel species were encountered, with giant floaters (*Pygandon grandis*), threeridge (*Ambema plicata*), and fat mucket (*Lampsilis silquoidea*) dominating the mussel assemblage (Appendix 1). No federally- or Wisconsin-listed endangered or threatened mussel species were encountered during the survey. The species assemblage found is typical of lentic habitat conditions. The lentic habitat conditions and the species assemblage found would indicate that the federally-listed Higgins' eye pearly mussel is not likely to be present in the project area.

Zebra mussel infestation on the native mussels was moderate, ranging from a few to many per native mussel. The zebra mussels were represented by a wide range of age classes, from very young to age 2.

No active bald eagle nests are located within one mile of the proposed project. Also, no habitat for eastern massasauga rattlesnakes would be affected by the project. Given the habitat similarities between Rosebud Island and the Brice Prairie Barrier Islands, the habitat requirements of the mussel species found during the Rosebud Island surveys, and the relatively small area affected by construction, this project is not likely to adversely affect federal or state-listed threatened/ endangered species.

4.3.3 Cultural Resources

The USACE Archaeologist, assisted by personnel from the Mississippi Valley Archaeology Center (MVAC), completed a Phase I cultural resource investigation for the Brice Prairie Barrier Islands Protection Project on 27 April and 27 May 2004. Methods included a literature review, shoreline survey of the island and adjacent terrace sideslope, pedestrian survey, shovel testing, and soil probing. Areas investigated included the barrier island, dredging locations, and two potential access/dredged material placement sites along the Brice Prairie terrace.

One archaeological site (47LCxxx /USACE-MVP-04-1), is located along the terrace near the southeast end of the barrier island and is a potential access/dredged material placement site (Figure 5). With the exception of possible additional work at this site, the USACE has determined that construction of the Project features (rock wedges, dredging, dredged material placement on the northwest end of the island and on the downstream access/dredged material placement site) will have no adverse effect on historic properties.

A summary of each of the potential project worksites identified under the Proposed Action include:

Lower Brice Prairie Barrier Island: Investigations along the lower barrier island included a shoreline survey via boat and pedestrian survey and soil probing in selected areas. The lower island is a lateral accretion deposit formed by channel migration in the alluvial fan of the Black River. Prior to construction of Lock and Dam 7, the main channel of the Black River flowed between the island and the Brice Prairie terrace, now captured by inundation of the Mississippi

River (Lake Onalaska, e.g., MRC 1894). Typically, lateral accretion deposits and alluvial fans have the potential to harbor deeply buried cultural deposits.

During the later half of the nineteenth century, the Black River Improvement Company constructed a berm atop the Island to control the flow of logs from the delta of the Black River (Sanford and Hirscheimer 1951; History of La Crosse County 1881). Informal soil probing (1-inch sampler) at various locations along the island (e.g., dredged material placement along the northwest portion of the island) confirmed that sediments consistent with berm construction (e.g., fine sands from dredged material) cap the island. No buried soils were identified within approximately 1-2 meters below the modern ground surface. Although buried soils may exist along the island, they are beyond the depth of practical identification methods. Further, the design and construction of the project features (rock wedges and dredged material placement) will not impact deeply buried deposits. No cultural resources were identified along the barrier island. The USACE has determined that construction of project features along the barrier island (rock wedges and dredged material placement on the northwest end of the island) will have no adverse effect on historic properties. No additional cultural resource work on the barrier island is recommended.

Dredge Cuts: Areas proposed for dredge cuts are mostly located along the former channel of the Black River. The northwestern dredge cut likely breached the island, rendering any cultural deposits that may have been located there highly disturbed. No historic shipwrecks or channel structures (e.g., wing dams) are within the project area and no cultural resources were identified along areas adjacent to the proposed dredge cuts. Therefore, the USACE has determined that dredging adjacent to the barrier island will have no adverse effect on historic properties and no additional cultural resource work is recommended.

Brice Prairie Terrace – Downstream Access/Placement Site: This site is located approximately 170 meters downstream of the southeast end of the lower barrier island. Here, re-shaping by cutting and filling has massively disturbed the terrace. A pedestrian walkover and a series of soil probes (1-inch sampler) indicate severe disturbance. For example, the original terrace has been cut down approximately 15 feet and leveled off, creating a filled portion of the scarp and obliterating the natural terrace and scarp morphology. No cultural resources were identified. The USACE has determined that placing dredged material at this location will have no adverse effect on historic properties and no additional cultural resource work is recommended.

Coordination with the Wisconsin State Historic Preservation Office (SHPO) is in progress.

4.3.4 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 Federal Register 7629 (1994), directs federal agencies to incorporate environmental justice in their decision-making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse

environmental effects of their programs, policies, and activities on minority or low-income populations.

No environmental justice issues exist for this alternative. The Brice Prairie Barrier Islands are currently unoccupied and unused for agricultural, industrial, or any other economic activity. This alternative would not create any environmental pollution. No minority or low-income populations would be displaced or negatively affected in any other way by Alternative C.

4.3.5 Cumulative Impacts

Stabilizing the eroding shorelines of islands in this complex increases the likelihood they will continue to provide habitat for a variety of wildlife. Moreover, this island complex protects shallow backwater habitat that supports a diverse aquatic plant community that provides habitat for fish, waterfowl, other migratory birds, furbearers, and amphibians. Widening and deepening sections of the Brice Prairie Channel may also provide overwintering habitat for Centrarchids if the right conditions develop.

Resource agencies have made stabilizing the shorelines of existing islands a priority in recent years for the same reasons. Examples of similar projects in lower Pool 7 and Lake Onalaska include Island 91, Red Oak Ridge Island and several small islands that surround it, the previously identified work along sections of the lower Brice Prairie Barrier Island, and two islands in the barrier island chain located in the extreme southwest corner of the lake. Island creation has also occurred through the 1989 Lake Onalaska Environmental Management Program habitat project.

Based on public scoping meetings held in September 2002 in the La Crosse area during the development of the Refuge's Comprehensive Conservation Plan, the public expressed the need to protect shorelines of islands now rather than rebuilding islands later.

4.4 Table 5. Summary of Environmental Consequences by Alternative

Impacts	Alternative A (Proposed Action)	Alternative B (No Action)	Alternative C
Islands Stabilized	Yes, with rock wedge in prioritized locations	No, erosion will continue and breaches will develop	Yes, with rock mounds in prioritized locations and combination rock wedge/mound structure
Dredging	Yes, in channel and for construction access	No Action	Yes, in channel, for construction access, and along shoreline
Site Disturbance	Localized depending on access	No Action	Localized depending on access
Plant Beds Affected	Localized	With potential loss of island for protection, beds may be impacted	Localized; additional disturbance to beds with shoreline dredging
Mussels Affected	Localized around worksites	Potential loss of island may change lake bottom and mussel habitat	Localized around worksites
Listed Species	Not likely to adversely affect	Loss of island may affect listed species	Not likely to adversely affect
Cultural Resources	No impacts to identified resources; island protects mainland sites	No impacts to identified resources; loss of island may impact mainland sites	No impacts to identified resources; island protects mainland sites
Short-term Impacts	Localized and minor depending on access	Continued erosion of islands and filling of channel expected	Localized depending on access
Long-term Impacts	Positive	Negative	Positive
Costs	Estimated @ \$88,100	N/A	Estimated @ \$178,150

5. List of Preparers

This Environmental Assessment was prepared by Jim Nissen, Bill Thrune, Kathy Mock, and Amy Seitz of the La Crosse District of the Refuge, Onalaska, WI, Sharonne Baylor located at Refuge Headquarters in Winona, MN and Don Powell, Jon Hendrickson, Dennis Anderson, and Brad Perkl of the U.S. Army Corps of Engineers, St. Paul District. Species information for sections dealing with listed, proposed, and candidate species were provided by David Heath, Wisconsin DNR and Gary Wege, U.S. Fish and Wildlife Service, Twin Cities Field Office.

6. Consultation and Coordination With the Public and Others

Service personnel met with staff from the Wisconsin DNR on 11 July 2002 to discuss the need for the project, identify potential alternatives for repair, and review permit needs.

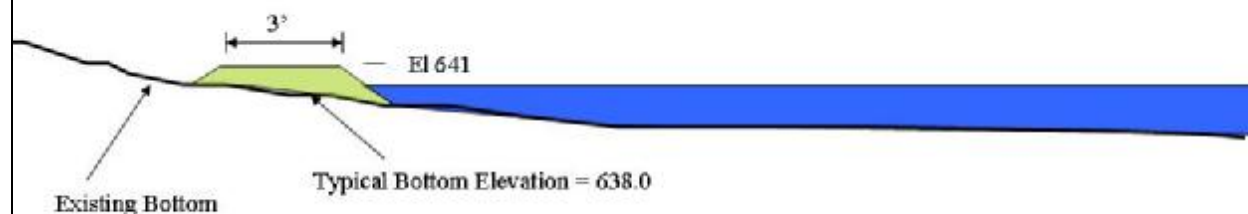
On 30 August 2002 Service personnel met with representatives from a number of organizations and agencies with interest in Lake Onalaska and the Brice Prairie Barrier Islands to discuss the need for the project and identify potential alternatives. The organizations and agencies in attendance were: La Crosse County Conservation Alliance, Brice Prairie Conservation Association, Lake Onalaska Protection and Rehabilitation District, Town of Onalaska, La Crosse County, UW-Extension Services, and USACE.

On 27 January 2004 about 35 people attended a public meeting conducted by Service/USACE personnel at the Town Hall, Town of Onalaska, Midway, WI. A project overview was provided, followed by a question/comment period. Topics that generated comments and more discussion were the need to dredge more material from the channel at the southeast end of the island, the cost estimates associated with the project features, access, and doing additional work at sites located in proximity to the barrier islands.

7. Public Comment on Draft EA and Response



Brice Prairie Barrier Islands Rock Wedge Design



A rock wedge with an outer slope of 1V:4H. The top width of rockfill would be 3' while the bottom footprint would be about 14' wide, resulting in a volume of one cubic yard of rockfill per linear foot.

Figure 2. Brice Prairie Barrier Islands Protection Project, Rock Wedge Design







Appendices

Appendix 1 References Cited for Sections on Cultural Resources

Appendix 2

Appendix 1 References Cited for Sections on Cultural Resources

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